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1 **COVID-19 and commerce complicate assessing the**  
2 **impact of minimum unit pricing for alcohol on health**  
3 **outcomes in Scotland –Authors’ reply**

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20 395 words

## Invited correspondence – Authors’ reply

21 We thank Dr Hsu for their correspondence on our study that evidenced the health  
22 benefits of the implementation of alcohol minimum unit pricing (MUP) in Scotland.<sup>1</sup>  
23 Dr Hsu highlights that the COVID-19 pandemic increases the uncertainty of our  
24 study findings, a limitation we previously outlined. This is not a unique issue and is  
25 one facing any policy implemented prior to the COVID-19 pandemic which is being  
26 evaluated during the pandemic period. Due to the widespread pandemic shock,  
27 there is no perfect way to account for all pandemic-related uncertainty. To reflect  
28 this, we avoided being selective and adopted several pre-specified sensitivity  
29 analyses.<sup>2</sup> This inclusive approach allowed for triangulation over how each analysis  
30 altered the measured health impact of the policy.

31  
32 Our main analysis incorporated how differences in pandemic-related restrictions  
33 varied across time and separately for Scotland and England, using the Oxford  
34 COVID-19 Government Response Tracker to adjust our statistical models.<sup>3</sup> This  
35 allowed us to account for periods when alcohol could not be sold in on-trade  
36 premises, and periods of intense pressure on the National Health Service in  
37 Scotland and England. Previously it has been shown that the timing and scale of  
38 early pandemic restrictions, and their impact on alcohol sales, were similar in both  
39 Scotland and England.<sup>4</sup> We previously acknowledged that whilst this accounts for  
40 some pandemic-related uncertainty, increased uncertainty during this period likely  
41 remains. We found that the first 32 months of the policy was associated with a  
42 significant 13.4% decrease (95% CI –18.4 to –8.3) in deaths wholly attributable to  
43 alcohol consumption. The cleanest approach to remove all pandemic-related  
44 uncertainty was to assess the policy impact using the pre-pandemic follow-up period  
45 only. Under this approach, MUP was associated with a significant 13.1% decrease  
46 (95% CI –18.9 to –6.8) in deaths wholly attributable to alcohol consumption in the  
47 first 20 months of the policy. Study findings were consistent across all of our different  
48 sensitivity analyses, thus increasing our confidence of the effect direction, and size,  
49 associated with the MUP policy.

50  
51 Dr Hsu also highlights that there were specific fluctuations in the rate of deaths  
52 wholly attributable to alcohol consumption. Our statistical modelling accounted for  
53 this, as adjustments for underlying temporal and seasonal trends were incorporated.  
54 Furthermore, we minimised any bias associated with temporal fluctuations through  
55 measuring outcomes over a long pre-intervention study period in both Scotland and  
56 England, and utilised the maximum follow-up time available.

57  
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59 authors declare no competing interests.

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